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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/422,887 10/21/99 FOGAL

R 95-0134.05

EXAMINER

MM91/1017

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PROPHY, J

ART UNIT

PAPER NUMBER

2822
DATE MAILED:

10/17/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/422,887

Applicant(s)

FOGAL ET AL.

Examiner

J. L. Brophy

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This office action is in response to the appeal brief filed 7/16/01. In response to the appeal brief, the finality of the previous office action is withdrawn.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "minimum angular offset" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 13-17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of stacking chips that ensures bond pad clearance, does not reasonably provide enablement for a method of stacking chips wherein the bond pads are not accessible. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The specification teaches a method for stacking a plurality of chips while ensuring bond pad clearance so that the wire bonding step may be performed after the chips have been

stacked. The specification does not provide enablement for a method of stacking the chips wherein the bond pads are covered by an overlying chip. In claims 13 and 17, the limitations of "at most a minimum bond pad clearance" and "less than a maximum underlying bond pad clearance" are not in commensurate scope with the specification since the limitations read on embodiments that are outside of the range of the embodiments presented in the specification. See MPEP §2164.08.

Please note that dependent claims are rejected because the claim from which they depend has been rejected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7-17 are rejected under 35 U.S.C. 102(b) as being anticipated by de Givry (EP 0,489,643 A1).

Re claim 7, de Givry teaches a method of stacking a plurality of die (14, 16) including the steps of mounting an upper die (16) on a lower die (14) and defining a minimum angular offset with said mounting, wherein said minimum angular offset allows access to a bonding site (18) on the lower die (14). See Fig. 1 and p. 6 of the translation.

Re claim 8, de Givry teaches the step of mounting a lowest die (14) on a substrate (12). See Fig. 2.

Re claims 9-11, de Givry teaches the steps of stacking all of the dies (14, 16, 26, 28), such that corresponding portions of any two of said dies define respective axes, and wherein said axes define an offset angle, followed by bonding wire to the dies (14, 16, 26, 28). See Fig. 3 and the third paragraph of p. 7 of the disclosure of de Givry.

Re claim 12, de Givry teaches the steps of stacking the plurality of dies (14, 16, 26, 28) along an axis, establishing an orientation for each die of said plurality of dies (14, 16, 26, 28), marginally clearing a line of sight to contact areas of any immediately underlying die with said orientation for said each die, wherein said line of sight is parallel to said axis, and clearing a line of sight to contact areas of any underlying die with said orientation for said each die (see Fig. 3 and p. 7 of translation).

Re claims 13 and 14, de Givry teaches the steps of spiraling the plurality of chips (14, 16, 26, 28) around an axis perpendicular to the plurality of chips (14, 16, 26, 28) and ensuring at most a minimum bond pad clearance to each chip of the plurality of chips (14, 16, 26, 28), wherein spiraling the plurality of chips further comprises spiraling the plurality of chips around an axis passing through each chip (Fig. 3).

Re claims 15 and 16, de Givry teaches that the step of spiraling includes spiraling the plurality of chips around an axis passing through the center of each chip and the step of ensuring bond pad clearance further comprises rotating a chip around the axis at least to the extent that a bond pad on an underlying chip is exposed (Fig. 3).

Re claim 17, de Givry teaches the steps of serially stacking all the dies (14, 16) and establishing a unique orientation for each die of said all dies (14, 16) wherein said orientation for each die defines less than a maximum underlying bond pad (18) clearance (Fig. 1 and p. 6 of the translation).

Response to Arguments

Applicant's arguments filed 7/16/01 have been fully considered but they are not persuasive.

Claim 7 recites the limitation "defining a minimum angular offset" and further defines "minimum angular offset" as allowing "access to a bonding site on said lower die." According to the criteria set forth in claim 7, the de Givry reference anticipates the claim. Applicant argues (middle of p. 7 of appeal brief filed 7/16/01) that the examiner "has made the erroneous assumption that the only defining feature of such an offset is that it allows access to a bonding site on the lower die." Since allowing access to a bonding site on the lower die is the only defining feature recited in the claim, it is not clear what other defining features applicant wishes to be read into the claim. Limitations from the specification are not read into the claims. Any additional limitations that applicant wishes to incorporate into the claims should be written into the claims.

Claim 12 recites the step of "marginally clearing a line of sight to contact areas of any immediately underlying die". This limitation is shown in the de Givry reference in Fig. 3, wherein a plurality of die are stacked and the line of sight to contact areas of underlying die is "marginally" cleared. The provided definition for "marginal" is "barely

within a lower standard". Since applicant has failed to define "marginal" or "lower standard", the de Givry reference could be interpreted as providing "marginal" clearance to the contact areas of the underlying die. Applicant argues (middle of p. 12) that "de Givry should be interpreted as teaching clearing a line of sight to the maximum extent possible". Even if de Givry is interpreted as such, the clearance could still be considered marginal since there are four die in the stack.

Since claim 13 does not provide a definition for "minimum" bond pad clearance, the de Givry reference is interpreted as providing at most a minimum bond pad clearance.

Re claim 17, the de Givry reference shows "less than a maximum" underlying bond pad clearance in Fig. 3. In order to provide maximum bond pad clearance to a lower die, the upper die would be stacked at a 90 degree angle to the lower die. In Fig. 3 of the de Givry reference, the die are stacked at a 45 degree angle to each other.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. L. Brophy whose telephone number is (703) 308-6182. The examiner can normally be reached on M-Th (7:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (703) 308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 308-7382 for After Final communications.

Art Unit: 2822

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

J.L.B.

jlb

October 10, 2001

Carl Whitehead, Jr.

**CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800**